

State the domain for each function.

1. $f(x) = 2x^3 + 1$

2. $f(x) = \frac{1}{\sqrt{2x}}$

3. $f(x) = |3x + 1|$

4. $f(x) = 2\sqrt[3]{3x + 1}$

5. $f(x) = 4$

Use a graphing utility to graph the following functions. Then state the domain and range for each graph.

6. $f(x) = \sqrt{4 - x^2}$

7. $f(x) = \frac{3x}{x+5}$

8. $f(x) = 1 - 2x^2$

9. $f(x) = \frac{|x-2|}{x-2}$

10. $f(x) = \frac{2x^2 + 3}{2x^2}$

11. $f(x) = \sqrt{x + 8} + 2$

12. $f(x) = \frac{1}{x^2 - 9}$

13. $f(x) = \ln(x-3)$

Evaluate the following functions.

*14. $f(x) = \begin{cases} x^2 - 4, & x \leq 3 \\ 1 - 2x^2, & x > 3 \end{cases}$

a) $f(-1)$

b) $f(3)$

c) $f(5)$

*15. $f(x) = x^2 + 4x - 10$, $g(x) = \frac{2}{3}x + 4$

a) $f(g(-6))$

b) $g(f(2))$

c) $(f+g)(x)$

d) $(fg)(x)$